Using the Graded Approach for the Development of QMPs and QAPPs in the OAQPS Ambient Air Quality Monitoring Program

DRAFT

Introduction

The Ambient Air Monitoring Program is a data collection activity mandated through the Clean Air Act (CAA) which provides the framework for all pertinent organizations to protect air quality. As illustrated in Figure 1, air quality samples are generally collected for one or more of the following objectives:

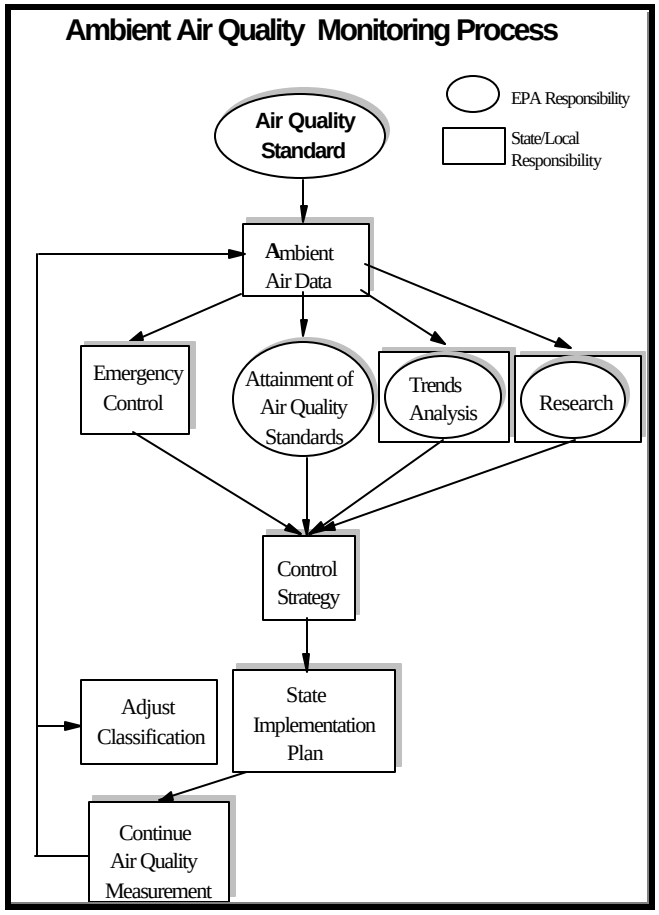

Figure 1 Ambient air quality monitoring process

- to judge compliance with and/or progress made towards meeting ambient air quality standards
- to activate emergency control procedures that prevent or alleviate air pollution episodes as well as develop long term control strategies
- to observe pollution trends throughout the region, including non-urban areas
- to provide a data base for research and evaluation of effects: urban, land-use, and transportation planning; development and evaluation of abatement/control strategies; and development and validation of diffusion models

With the end use of the air quality samples as a prime consideration, the ambient air monitoring networks are designed to:

1. determine the highest concentrations expected to occur in the area covered by the network;
2. determine representative concentrations in areas of high population density;
3. determine the impact on ambient pollution levels of significant sources or source categories;
4. determine the general background concentration levels;
5. determine the extent of regional pollutant transport among populated areas, and in support of secondary standards; and
6. determine the welfare-related impacts in more rural and remote areas (such as visibility impairment and effects on vegetation)

The Ambient Air Monitoring program is implemented by State, Local and Tribal monitoring organization that are funded through State Assistance Agreements (STAG) funds which are grant funds. Since the Ambient Air Monitoring Program provides for the collection of data for a number of monitoring objectives, flexibility in the development of quality management plans and quality assurance program plans are necessary. Data collection for the purpose of comparison to the National Ambient Air Quality Standards (NAAQS) will require more stringent, federally mandated requirements while monitoring programs for special purposes or particular State, Local or tribal needs may not require the same level of quality assurance. The following information describes the use of the graded approach for the development of quality management plans, data quality objectives and quality assurance project plans for the Ambient Air Monitoring Program.

Quality Management Plans

The QMP describes the quality system in terms of the organizational structure, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, and assessing activities involving EDOs. Organizations that implement long term monitoring programs with EPA funds should have a separate QMP document. Smaller organizations or organizations that do infrequent work with EPA funds may be allowed to combine the QMP with the QAPP. In addition, approval of the recipient's QMP by the EPA Project Officer and the EPA Quality Assurance Manager, may allow delegation of the authority to review and approve Quality Assurance Project Plans (QAPPs) to the recipient based on procedures documented in the QMP.

The Graded QMP-

Each program should have their quality system documented. Here are a few ways that this could be handled

Concept - Small organizations will not be able to assemble a quality system overnight, so allow provisions for those making progress towards developing a quality system. If it is clear that the goals are understood and that progress is being made, accept a non-optimal structure for the interim. Management generally can understand a QMP using the concept of a long term strategic plan with an open ended approach to the QMP development that will involve continuous improvement.

1. Small organization that just received their first EPA grant. This organization could incorporate their QMP into their QAPP.
2. Small organization - implementing multiple EDOs with EPA- It is suggested that a appropriate separate QMP be written .
3. Medium or large organization- separate QMP and QAPPs.

Quality Assurance Project Plans

The QAPP is a formal document describing, in comprehensive detail, the necessary QA/QC and other technical activities that must be implemented to ensure that the results of work performed will satisfy the stated performance criteria (DQOs). The quality assurance policy of the EPA requires every EDO to have written and approved quality assurance project plans (QAPPs) prior to the start of the EDO. It is the responsibility of the Program Manager/WAM to adhere to this policy. If the Program Manager/WAM proceeds without an approved QAPP, he/she assumes all responsibility.

The Ambient Air Monitoring Program will utilize a four-tiered project category approach to the Ambient Air QA Program in order to effectively focus QA. Category I involves the most stringent QA approach utilizing all QAPP elements as described in EPA R5 (see Table 2), whereas Category IV is the least stringent, utilizing fewer elements. In addition, the amount of detail or specificity required in each element will be less as one moves from category I to IV. Table 1 provides information that helps to define the categories of QAPPs based upon the data collection objective. Each type of Ambient Air Monitoring programs EDO will be identified by one of these categories. The comment area of the table will identify whether QMPs and QAPPs can be combined and the type of data quality objectives (DQO) required (see below). Table 2 identifies which of the 24 QAPP elements are required for each category of QAPP.

Flexibility on the systematic planning process (DQOs).

As indicated in Table 1, all categories require some type of statement about the program or project objectives. Three categories use the term DQOs, but there will be flexibility in how these DQOs will be developed based on the particular category. As an example, a category 1 project would have formal DQOs (including decision error computation) that would be developed by OAQPS whereas category II QAPPS may have formal DQOs developed if there are national implications to the data (i.e., Speciation Trends Network) or flexible DQOs (not having decision error computations) by organizations implementing important projects but more local in scope. Categories 3 and 4 would require less formal DQOs; to a point that only project goals (category 4) may be necessary.

Standard Operating Procedures- (SOP)

SOPs must be developed as part of the QAPP submittal process and will address many of the QAPP elements.

Table 1. Ambient Air Monitoring Program QAPP/QMP categories

Categories	Programs	QAPP/QMP Comments	DQO
Category 1 Projects include EDOs that directly support rulemaking, enforcement, regulatory, or policy decisions. They also include research projects of significant national interest, such as those typically monitored by the Administrator. Category I projects require the most detailed and rigorous QA and QC for legal and scientific defensibility. Category I projects are typically stand-alone; that is, the results from such projects are sufficient to make the needed decision without input from other projects.	SLAMS NAMS PSD NCore IMPROVE CastNet	Most agencies implementing Ambient Air Monitoring Networks will have separate QMPs and QAPPs. However Region has discretion to approve QMP/QAPP combination for small monitoring organizations (i.e., Tribes)	Formal DQOs
Category 2 Projects include EDOs that complement other projects in support of rulemaking regulatory, or policy decisions. Such projects are of sufficient scope and substance that their results could be combined with those from other projects of similar scope to provide necessary information for decisions. Category II projects may also include certain high visibility projects as defined by EPA management	Speciation Trends Toxics Mon. Super Sites	Most agencies implementing Ambient Air Monitoring Networks will have separate QMPs and QAPPs. However Region has discretion to approve QMP/QAPP combination for small monitoring organizations (i.e., Tribes)	Formal DQOs for national objective, Flexible DQOs for localized objectives
Category 3 Projects include EDOs performed as interim steps in a larger group of operations. Such projects include those producing results that are used to evaluate and select options for interim decisions or to perform feasibility studies or preliminary assessments of unexplored areas for possible future work.	SPM One time Studies	EDOs of short duration. QMP and QAPP can be combined..	Flexible DQOs
Category 4 Projects involving EDOs to study basic phenomena or issues, including proof of concepts, screening for particular analytical species, etc. Such projects generally do not require extensive detailed QA/QC activities and documentation	Education/Outreach		Project Objectives or Goals

Table 2 QAPP Elements

QAPP Element		Category Applicability
A1	Title and Approval Sheet	I, II, III, IV
A2	Table of Contents	I, II, III
A3	Distribution List	I,
A4	Project/Task Organization	I, II, III
A5	Problem Definition/Background	I, II, III
A6	Project/Task Description	I, II, III, IV
A7	Quality Objectives and Criteria for Measurement Data	I, II, III, IV
A9	Special Training Requirements/Certification	I
A10	Documentation and Records	I, II, III
B1	Sample Process (Network) Design	I, II, III, IV
B2	Sampling Methods Requirements	I, II, III,
B3	Sample Handling and Custody Requirements	I, II, III
B4	Analytical Methods Requirements	I, II, III, IV
B5	Quality Control Requirements	I, II, III, IV
B7	Instrument Calibration and Frequency	I, II, III
B8	Inspection/Acceptance Requirements for Supplies and Con.	I,
B9	Data Acquisition Requirements for Non-direct Measurements	I, II, III
B10	Data Management	I, II
C1	Assessments and Response Actions	I, II,
C2	Reports to Management	I, II,
D1	Data Review, Validation, and Verification Requirements	I, II, III
D2	Validation and Verification Methods	I, II
D3	Reconciliation and User Requirements	I, II,